

NEW GENUS, *APLANUSIELLA*, AND TWO NEW SPECIES OF
LEAFHOPPERS FROM SOUTHWESTERN UNITED STATES
(HOMOPTERA: CICADELLIDAE: DELTOCEPHALINAE)

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ABSTRACT.—A new genus, *Aplanusiella* (type-species, *Aplanusiella utahensis*, n. sp.) and two new species, *A. utahensis* and *A. californiensis*, are described and illustrated. The two species are allopatric and coexist on the same host genus, (*Atriplex*) with members of a closely allied leafhopper genus, *Aplanus*. Notes on distribution of hosts and leafhoppers as well as leafhopper intergeneric relationships are also given.

Key words: leafhoppers, new species, new genus, Cicadellidae, *Aplanusiella*, distribution, hosts.

In a 1986–89 survey of rangeland leafhoppers of Utah (Haws et al. 1989), two populations were taken from *Atriplex* spp. and tentatively identified as members of the genus *Aplanus*. One population was later identified as *Aplanus albidus* (Ball) from shadscale, *Atriplex confertifolia* (Torr. & Frem.) Wats. The other population was collected from four-winged saltbush, *Atriplex canescens* (Pursh) Nutt. and is described herein as a new genus and new species closely allied to *Aplanus*. An additional new species is also described from specimens collected in California on *Atriplex* sp. Notes are given on the phytogeography of the host genus, *Atriplex*, the distribution of the two genera, and their taxonomic and host relationships.

The general habitus (form and color pattern) of the component populations are so remarkably similar that it is likely that additional material of the new taxa will be found in other repositories. Only after dissection and examination of the male genital structures will their true identity be revealed. Moreover, it is probable that additional new species will come to light after more thorough collecting is done on *Atriplex* spp. in southwestern United States and northern Mexico. This assumption is based on two additional populations of female specimens in hand from Nevada and California for which males are presently unknown and are required for definitive generic placement. The female seventh sternal characters appear to place these populations in the new genus (*sensu stricto*).

Populations of these groups are rather rare in *Atriplex* host areas of the high- to low-desert regions of western North America.

Aplanusiella, new genus

TYPE SPECIES.—*Aplanusiella utahensis*, n. sp.

Small, rather slender species. Related to *Aplanus* Oman but smaller and with distinctive male genital characters. General color light yellow to ivory with numerous, nearly concentric, tiny rufous spots on forewings, spots not usually forming lines as typically present in *Aplanus*, large spots in clavus and in apical crossveins of costa formed by aggregation of smaller spots, pronotum and scutellum sometimes with tiny spots.

Head narrower than pronotum, anterior margin obtusely angled and rounded to front, crown produced medially to about one and one-half times length next to inner margin of eye, disk somewhat depressed in middle but lacks transverse depression before apex as in *Aplanus*; pronotum and scutellum as in *Aplanus*; forewings with inner anteapical cell open basally, appendix well developed; clypeus and clypellus as in *Aplanus*.

Male pygofer with macrosetae in apical half and with prominent caudoventral spine, sometimes crossing over in caudal view; aedeagus small, base large in lateral view, apical half narrow, tubular, sometimes with small angulate protrusion at base of shaft on dorsal margin, gonopore subapical on ventral margin; connective

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short, Y-shaped, articulated with aedeagus; style broad, apophysis short; plate triangulate with row of macrosetae submarginally and row of microsetae marginally, female seventh sternum with short projection medially on caudal margin.

Two allopatric species are known that occur in the southwestern states of Utah and California on desert shrubs of the genus *Atriplex*. *Aplanusiella* can be distinguished from *Aplanus* by the smaller size, by the absence of a preapical depression on the crown, by the presence of a prominent caudoventral pygofer spine, by the smaller aedeagus that lacks apical processes, and by the female seventh sternum that has a more distinctive spatulate process on the middle of the caudal margin.

Aplanusiella utahensis, n. sp.

Figs. 1a-1l

LENGTH.—Male 3.5–3.75 mm, female 4.00–4.20 mm.

General color pale yellow to ivory with numerous, nearly concentric, tiny rufous spots on forewings, large aggregate spots on apex of clavus and in apical crossveins of costa, sometimes with few similar spots on pronotum and scutellum. Related to *Aplanusiella californiensis*, n. sp., but with distinctive male genital and female seventh sternal characters.

MALE.—Pygofer in lateral view with long, stout caudoventral process that sometimes crosses its counterpart in caudal view, but usually closely appressed to caudal margin of pygofer (Fig. 1b); plate long, triangulate with uniseriate macrosetae submarginally and uniseriate microsetae marginally on outer margin (Fig. 1c); style in dorsal view long, broad in basal 2/3, apophysis short, curved and pointed apically (Fig. 1d); connective short, Y-shaped (Fig. 1e); aedeagus in lateral view short, ventral margin abruptly angled near middle, broad basally, shaft narrow, tubular with basal triangulate projection on either side of dorsal margin, gonopore subapical on ventral margin (Figs. 1f–1k).

FEMALE.—Seventh sternum broadly excavated on caudal margin, with prominent median spatulate process (Fig. 1l).

HOLOTYPE (male).—UTAH: Daggett Co., Brown's park, Pyke plots, roadside, 12.VI.1987, four-winged saltbush, *Atriplex canescens*, B. A. Haws (CAS). Paratypes, 1 male, Daggett Co., Brown's park, 3.5 mi E Jarvis ranch, 26.VI.1987, on four-winged saltbush, *Atriplex canescens*, Haws, Nelson (author's collection); 2 males,

1 female, San Juan Co., Dry Valley, 8.IX.1987, four-winged saltbush, *Atriplex canescens*, B. Haws, A. Issa (USU); 2 males, 2 females, Uintah Co., Bonanza, 14.VII.1975–3.IX.1976, *Atriplex canescens*, G. E. Bohart (USU); 1 male, Grand Co., Jughandle Potash Rd., 19.VII.1987, four-winged saltbush, *Atriplex canescens*, B. A. Haws, C. R. Nelson (BYU); 1 male, Grand Co., Colorado River, Hwy 128, 6 mi NE jct. Hwy 191, 26.V.1987, *Atriplex canescens*, B. A. Haws, C. R. Nelson (USU).

REMARKS.—This species can be distinguished from *californiensis*, n. sp., by the longer caudoventral pygofer process, by the abruptly angled ventral margin of the aedeagus, by the presence of a small basal triangulate process on the dorsal margin of the aedeagal shaft, and by the prominent spatulate process on the middle of the female seventh sternum.

The species is known from the eastern counties of Utah bordering Colorado and is likely present in the western part of that state and in northern Arizona where the host occurs. Collection dates suggest that the species has two generations per year and presumably overwinters as eggs on its host.

Aplanusiella californiensis, n. sp.

Figs. 1m–1s

LENGTH.—Male 3.30–3.50 mm, female 3.60–3.80 mm.

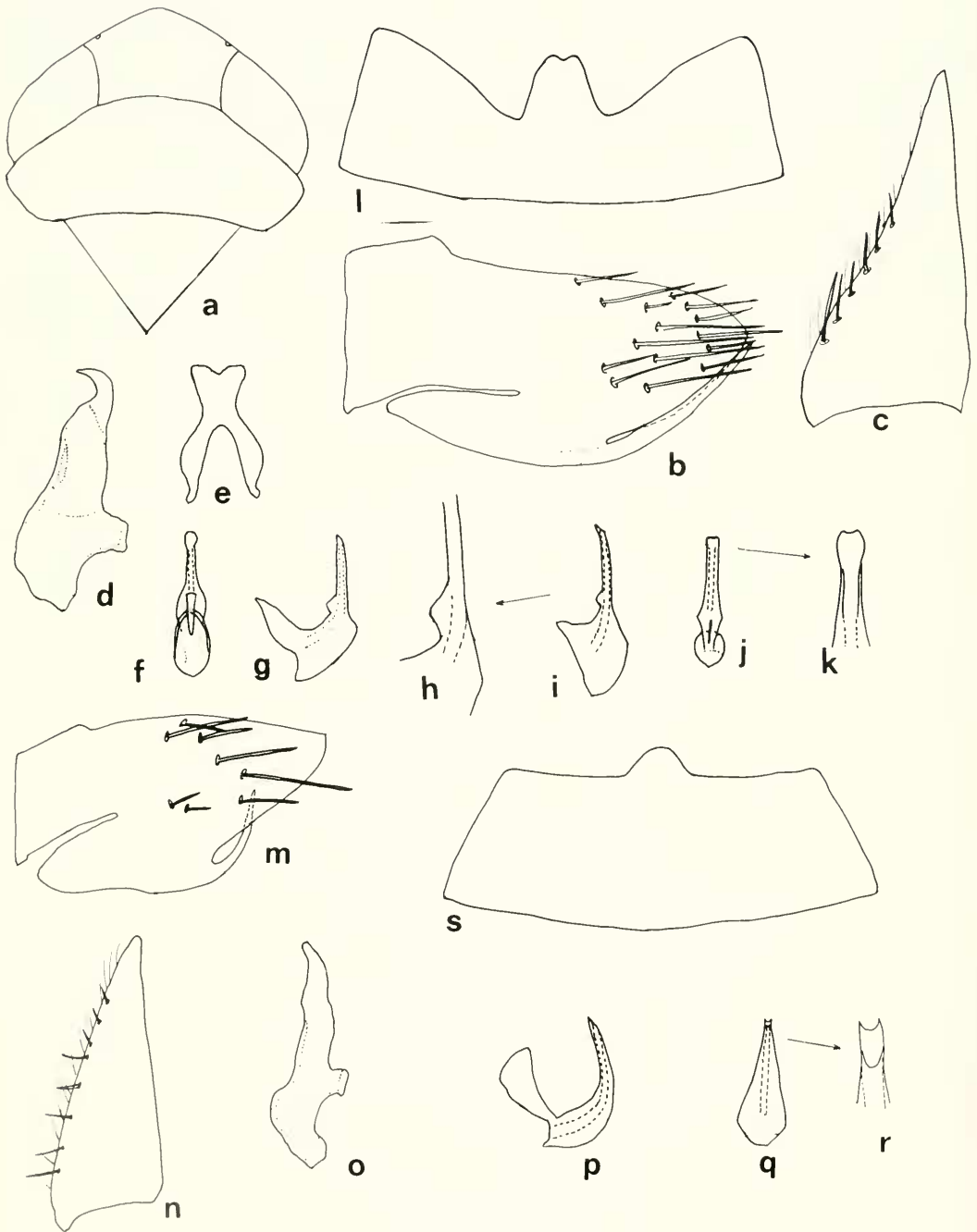
General color as in *A. utahensis*, n. sp., and related to that species but with distinctive male genital and female seventh sternal characters.

Head similar to *utahensis* except not as pointed apically.

MALE.—Pygofer in lateral view with moderately long caudoventral process that usually crosses its counterpart in caudal view, not closely appressed to margin of pygofer (Fig. 1m); plate long, triangulate, with row of marginal microsetae and submarginal macrosetae (Fig. 1n); style in dorsal view long, narrow, apophysis short, obliquely truncate apically (Fig. 1o); aedeagus in lateral view short, ventral margin gradually curved, apical third tubular, broad basally in ventral view, tapered toward apex, gonopore subapical on ventral margin (Figs. 1p–1r).

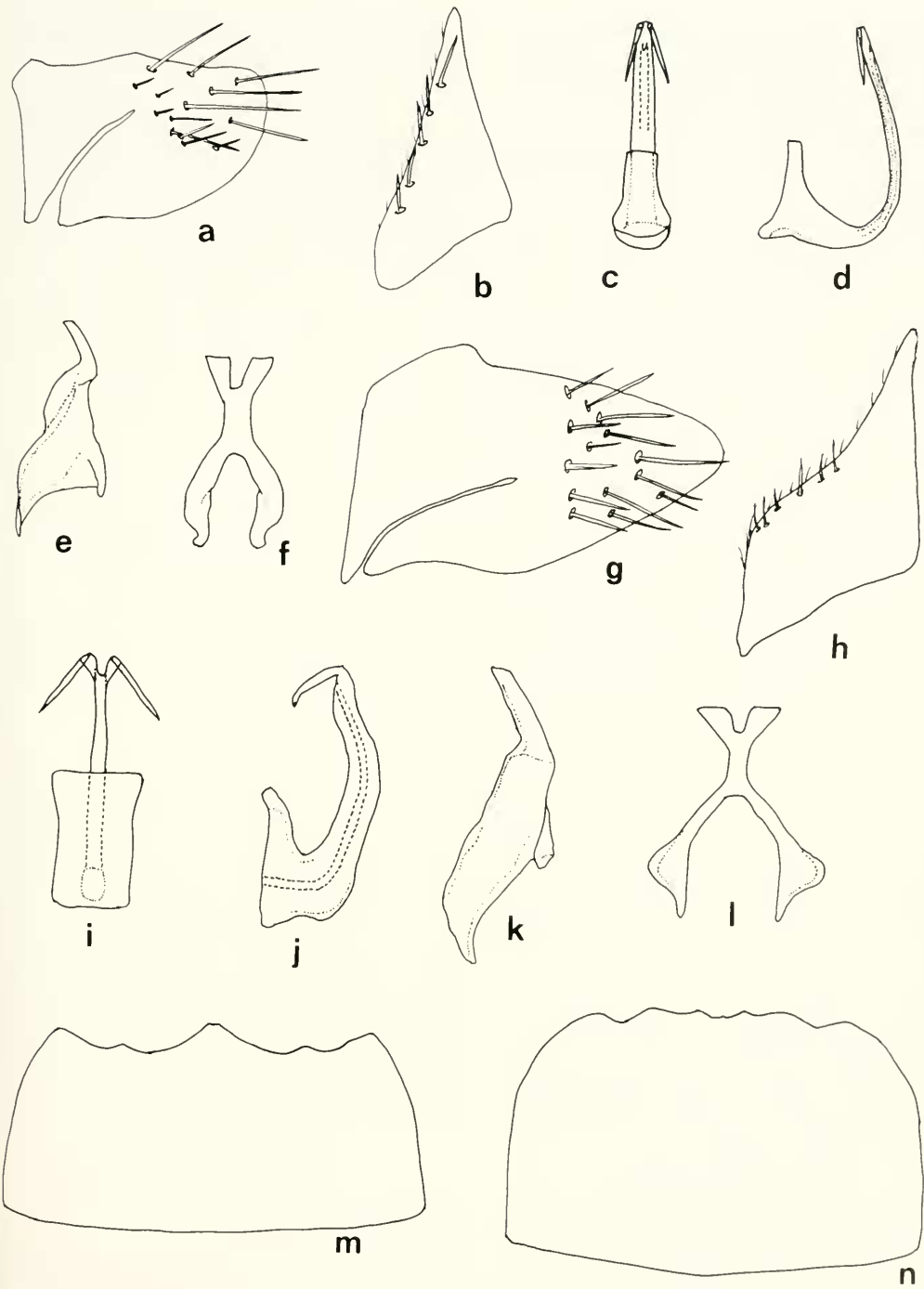
FEMALE.—Seventh sternum with truncate caudal margin except for short, median process (Fig. 1s).

HOLOTYPE (male).—CALIFORNIA: Riverside Co., Indio, 12.I.1988, *Atriplex* sp., G. N.



Figs. 1a-1l. *Aplanusiella utahensis*, n. sp.: 1a, head, pronotum, and scutellum, dorsal view; 1b, male pygofer, lateral view; 1c, right plate, ventral view; 1d, right style, dorsal view; 1e, connective, dorsal view; 1f, aedeagus, dorsal view; 1g, same, lateral view; 1h, same (enlarged), showing triangulate process, lateral view; 1i, same (showing variation), lateral view; 1j, same (enlarged), showing apex of aedeagus, ventral view; 1k, same (enlarged), showing apex of aedeagus, ventral view; 1l, female seventh sternum, ventral view.

Figs. 1m-1s. *Aplanusiella californiensis*, n. sp.: 1m, male pygofer, lateral view; 1n, right plate, ventral view; 1o, right style, dorsal view; 1p, aedeagus, lateral view; 1q, same, ventral view; 1r, same (enlarged), showing apex of aedeagus, ventral view; 1s, female seventh sternum, ventral view.



Figs. 2a–2f, 2m. *Aplanus pauperculus* (Ball): 2a, male pygofer, lateral view; 2b, right plate, ventral view; 2c, aedeagus, dorsal view; 2d, same, lateral view; 2e, right style, dorsal view; 2f, connective, dorsal view; 2m, female seventh sternum, ventral view.

Figs. 2g–2l, 2n. *Aplanus albidus* (Ball): 2g, male pygofer, lateral view; 2h, right plate, ventral view; 2i, aedeagus, dorsal view; 2j, same, lateral view; 2k, right style, dorsal view; 2l, connective, dorsal view; 2n, female seventh sternum, ventral view.

Oldfield (CAS). Paratypes, 2 males, 6 females, same data as holotype (OSU); 5 males, 16 females, Imperial Co., Brawley, 23.VIII.1983, *Atriplex* sp., J. Williams (OSU, BYU).

REMARKS.—This species can be separated from *utahensis* by the shorter caudoventral pygofer spine, by the smoothly curved ventral margin of the aedeagus, by the lack of a basal process on the aedeagal shaft, by the broader base of the aedeagus in ventral view, and by the truncate caudal margin and shorter median process of the female seventh sternum.

This species is known from southern California on *Atriplex* (species unknown) at elevations below sea level. Collection dates suggest that the species overwinters in the adult stage and may have as many as three generations per year.

Aplanus Oman

Aplanus Oman, 1949:138. Type species, *Eutettix pauperculus* Ball.

Only two species are known in the genus, both assigned by Oman (1949). Crowder (1952) treated the group with a key to species, redescription, and illustrations of the genital characters. The range of *Aplanus* is much broader in western United States than the presently known range of *Aplanusiella*.

Characters are given for *Aplanus pauperculus* (Figs. 2a–2f, 2m) and *Aplanus albidus* (Ball) (Figs. 2g–2l, 2n) to show generic relationships between them and species of *Aplanusiella*. In *Aplanus* the pygofer lacks the caudal spine, and the aedeagus is about twice as long with distinctive terminal processes. The female seventh sternum lacks the obvious median caudal process that is present in *Aplanusiella*. Ball (1900) reported that shadscale, *Atriplex confertifolia* (Torr. & Frem.) Wats., was the host of *Aplanus albidus*. The specific host of *A. pauperculus* is yet unknown.

Phytogeography of *Atriplex*

Four-winged saltbush (*Atriplex canescens*) is endemic to western North America. Its range extends from southern Canada to northern Mexico. Shadscale (*Atriplex confertifolia*) is also endemic, but its range is more restrictive within western United States (Stutz and Sanderson 1979, 1983, Sanderson et al. 1990). Both species produce hybrids between themselves and other species of *Atriplex*. However, autopolyploidy is the most common genetic mechanism in both species, which have produced a number of races

throughout their range. These races and other ecotypes have been identified and mapped by these workers.

The biogeographical relationships between *Aplanus* and *Aplanusiella* species and their host species are poorly known. Although hosts have been identified for two leafhoppers (*Aplanus albidus* and *Aplanusiella utahensis*) of the four known species, nothing is known about the others nor has preference, if any, of these leafhoppers for races or ecotypes been studied in *Atriplex*. The role of *Atriplex* in the evolutionary development and speciation of the group is likewise unknown.

DEPOSITION OF TYPE SPECIMENS

The holotype specimens of *Aplanusiella utahensis* and *Aplanusiella californiensis* are deposited in the California Academy of Sciences, San Francisco (CAS); paratypes are in Oregon State University, Corvallis (OSU), Utah State University, Logan (USU), and Monte L. Bean Museum, Brigham Young University, Provo, Utah (BYU).

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